

WHAT IS CLAIMED IS:

1. In a public key encryption system, a method for selecting a current secret key to be used to encrypt a message, the method comprising:
  - determining whether a new secret key is required;
  - if a new secret key is required:
    - generating the new secret key;
    - generating a new encrypted secret key by encrypting the new secret key using a public key associated with a recipient of the message;
    - storing in a local data store the new secret key as a reusable secret key, the new encrypted secret key as a corresponding reusable encrypted secret key, and counter data associated with the reusable secret key; and
    - selecting as the current secret key the new secret key; and
  - if a new secret key is not required:
    - retrieving from the local data store a reusable secret key and the corresponding reusable encrypted secret key;
    - updating the counter data associated with the reusable secret key in the local data store; and
    - selecting as the current secret key the reusable secret key.
2. The method of claim 1, further comprising storing in the local data store state information associated with a cryptographic algorithm in which the reusable secret key is applied.
3. The method of claim 1, wherein determining whether a new secret key is required comprises:
  - determining whether a previous message has been sent to the recipient;
  - if a previous message has not been sent to the recipient, determining that a new secret key is required; and
  - if a previous message has been sent to the recipient:
    - retrieving the counter data from the local data store; and
    - comparing the counter data to a reuse criterion;
    - if the counter data satisfies the reuse criterion, determining that a new secret key is not required; and

11 if the counter data fails to satisfy the reuse criterion, determining that a  
12 new secret key is required.

1 4. The method of claim 3, wherein the reuse criterion comprises a  
2 maximum number of messages and the counter data comprises a cumulative number of  
3 messages previously sent using the reusable secret key.

1 5. The method of claim 3, wherein the reuse criterion comprises a  
2 maximum number of bytes of message data and the counter data comprises a cumulative  
3 number of bytes of message data previously sent using the reusable secret key.

1 6. The method of claim 3, wherein the reuse criterion comprises a  
2 maximum amount of elapsed time and the counter data comprises an amount of elapsed time  
3 since the reusable secret key was generated.

7. The method of claim 1, further comprising:  
encrypting the message using the current secret key; and  
sending the encrypted message and the encrypted secret key.

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4 8. In a public key enveloping system, a method of decrypting a received  
5 message comprising:  
6 extracting an encrypted secret key from the received message;  
7 determining whether the encrypted secret key was previously decrypted;  
8 if the encrypted secret key was not previously decrypted:  
9 decrypting the encrypted secret key; and  
10 storing the encrypted secret key and the decrypted secret key in a local  
11 data store;  
if the encrypted secret key was previously decrypted, retrieving the decrypted  
secret key from the local data store; and  
decrypting the message using the decrypted secret key.

1 9. The method of claim 8, wherein determining whether the encrypted  
2 secret key was previously decrypted comprises:  
3 searching for the encrypted secret key in the local data store;  
4 if the encrypted secret key is found in the local data store, determining that the  
5 encrypted secret key was previously decrypted; and

- 6 if the encrypted secret key is not found in the local data store, determining that  
7 the encrypted secret key was not previously decrypted.

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